

DHA Study Buddy Tutorial Format

- **Shoulder joint:**

- FUNCTIONAL ANATOMY & BIOMECHANICS
 - a) GH Joint arthrokinematics /Osteokinematics
 - b) Scapulothoracic and GH Rhythm
 - c) Concentric and eccentric muscle activity
 - d) Ligaments & their function
 - e) Open and Closed pack position
 - f) Capsular pattern of restrictions
- PATHOLOGICAL CONDITIONS- Pathomechanics, examination & assessment, possible Differential diagnosis & Physical therapy management
 - a) Scapula tipping and Winging – muscles involved in the pathology
 - b) Signs and Symptoms of possible peripheral nerve involvement
 - c) Impingement Syndrome
 - d) Adhesive capsulitis
 - e) Degenerative Joint disorder-osteoarthritis
 - f) Instability- Anterior, Posterior, Multi-directional & its symptoms
 - g) Shoulder joint dislocation
 - h) Glenoid labrum tears
 - i) Soft tissue injuries & their differential diagnosis- Bursitis, Tendinitis, tendinosis/tendinopathy
Ligament injuries
 - j) Thoracic Outlet Syndrome

- **Elbow Joint:**

- FUNCTIONAL ANATOMY & BIOMECHANICS
 - a) Osteology and Arthrology of Humeroulnar, Humeroradial, Proximal and Distal Radioulnar joint
 - b) Ligaments & its function

- c) Carrying angle
- d) Conjoint rotations of radius & ulna

- PATHOLOGICAL CONDITIONS- Pathomechanics, examination & assessment, possible Differential diagnosis & Physical therapy management

- a) Medial and Lateral epicondylitis
- b) Pushed elbow & Pulled Elbow
- c) Osteochondritis of Humeral capitulum
- d) Nerve entrapments- Median, Ulnar and Radial Nerve
- e) Ligament injuries

- **Wrist Joint:**

- FUNCTIONAL ANATOMY & BIOMECHANICS

- a) Osteology and arthrology of all joints of wrist and hand
- b) CMC joint- movements & muscles

- PATHOLOGICAL CONDITIONS- Pathomechanics, examination & assessment, possible Differential diagnosis & Physical therapy management

- a) Colle's and Smith's fracture
- b) Scaphoid fracture
- c) Carpal tunnel syndrome
- d) Dupuytren's Contracture
- e) De Quervain's tenosynovitis
- f) Ape Hand deformity
- g) Trigger Finger
- h) Boutonniere's deformity
- i) Swan neck deformity
- j) Mallet finger
- k) Gamekeeper's thumb
- l) Boxer's Thumb

- **Hip Joint:**

- FUNCTIONAL ANATOMY & BIOMECHANICS

- a) Osteology of femur- Angle of inclination and Angle of torsion
- b) Lumbo-pelvic rhythm
- c) Lower Crossed Syndrome and muscles involved
- d) Anterior & Posterior Innominate rotation
- e) Ligaments surrounding hip joint & pelvis and their function
- f) Sacroiliac joint biomechanics

- PATHOLOGICAL CONDITIONS- Pathomechanics, examination & assessment, possible Differential diagnosis & Physical therapy management

- a) Osteonecrosis of femoral head
- b) Coxa valga & Coxa vara
- c) Legg-Calve Perthes Disease
- d) Iliotibial band friction syndrome
- e) Trochanteric bursitis
- f) Congenital Dislocation of Hip
- g) Slipped Capital Femoral Epiphysis
- h) Osteoarthritis of hip joint
- i) Piriformis Syndrome
- j) Trendelenburg syndrome

- **Knee joint:**

- FUNCTIONAL ANATOMY & BIOMECHANICS

- a) Screw home mechanism
- b) Osteology and arthrology of surrounding joints
- c) Ligaments and its functions

d) Meniscus anatomy-its location, function and movements

- PATHOLOGICAL CONDITIONS- Pathomechanics, examination & assessment, possible Differential diagnosis & Physical therapy management

a) Ligament injuries – ACL, MCL, PCL

b) Meniscus injuries

c) Bursitis- Pes anserine bursitis, Infrapatellar fat pad syndrome

d) Abnormal positions of patella- Patella alta, baja and infera

e) Patello-femoral pain syndrome

f) Osgood Schlatter's disease

g) Patellar tendinopathy (Jumper's knee)

h) Genu varum & Genu valgum

i) Differential Diagnosis of Meniscal vs Ligament Injuries

j) Differential Diagnosis of Lateral Knee Pain Conditions such as >> PFPS vs Lateral Collateral Injury vs IT band Pain at lateral Knee vs Knee OA

k) Differential Diagnosis of Ant knee pain Conditions such as Patellar Tendinitis Vs Jumpers Knee vs Knee OA vs Osgood Schlatter disease

l) Differential Diagnosis of medial Knee pain such as Pes Anserine bursitis vs Weak VMO pain Vs Knee OA vs MCL injury.

• **Ankle and Foot:**

- FUNCTIONAL ANATOMY & BIOMECHANICS

a) Osteology and Arthrology of joints of forefoot, midfoot and hindfoot

b) Ligaments and their function

- PATHOLOGICAL CONDITIONS- Pathomechanics, examination & assessment, possible Differential diagnosis & Physical therapy management

a) Conditions of Lower Leg: Stress Syndromes, Compartment syndrome, Stress fracture

b) Ligament sprains

- c) Tarsal Tunnel syndrome
- d) Achilles tendinopathy
- e) Plantar fasciitis
- f) Flexor hallucis tendinopathy
- g) Pes cavus and Pes planus
- h) Metatarsus adductus
- i) Talipes equinovarus
- j) Metatarsalgia
- k) Hallux valgus
- l) Rarefoot and forefoot varus and valgus

- **Spine:**

- FUNCTIONAL ANATOMY & BIOMECHANICS
 - a) Osteology and arthrology of vertebral joints
 - b) Rule of 3 for spinous processes
 - c) Coupled movements
 - d) Postural deviations and its impact
 - e) Mechanics of trunk bending in relation to pelvis
- PATHOLOGICAL CONDITIONS- Pathomechanics, examination & assessment, possible Differential diagnosis & Physical therapy management
 - a) Muscles strain
 - b) Disc derangements
 - c) Spondylosis vs Spondylolysis Vs Spondylolisthesis
 - d) Disc herniation and its types
 - e) Facet syndrome
 - f) Ankylosing Spondylitis
 - g) Degenerative joint disease

h) Whiplash injury

- **TMJ:**

- FUNCTIONAL ANATOMY & BIOMECHANICS

- a) Muscle actions

- b) Joint movement

- PATHOLOGICAL CONDITIONS- Pathomechanics, examination & assessment, possible Differential diagnosis & Physical therapy management

- a) Disc displacement with and without reduction

- b) Various synovial joint pathologies and their differential diagnosis

- **Specific topics:**

- Gait mechanics- normal and abnormal gait patterns, muscles involved, causes and its management

- Posture- normal and abnormal postural deviations, its causes, muscles involved, joint pathology due to abnormal posture and its management

- Soft tissue mobilization- Grades, concave-convex rule of all joints and procedure for mobilization; indications and contraindications

- Joint replacement procedures: THR, TKR, Total shoulder arthroplasty in detail

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NEUROMUSCULAR SYSTEM

- **Anatomy and physiology**

- Lobes and their function

- Basal Ganglia and structures involved with their functions

- Brainstem: Midbrain, Pons and Medulla

- Cerebellum and its function

- Spinal cord tracts: ascending and descending; their functions and location

- Cranial nerves and its pathology

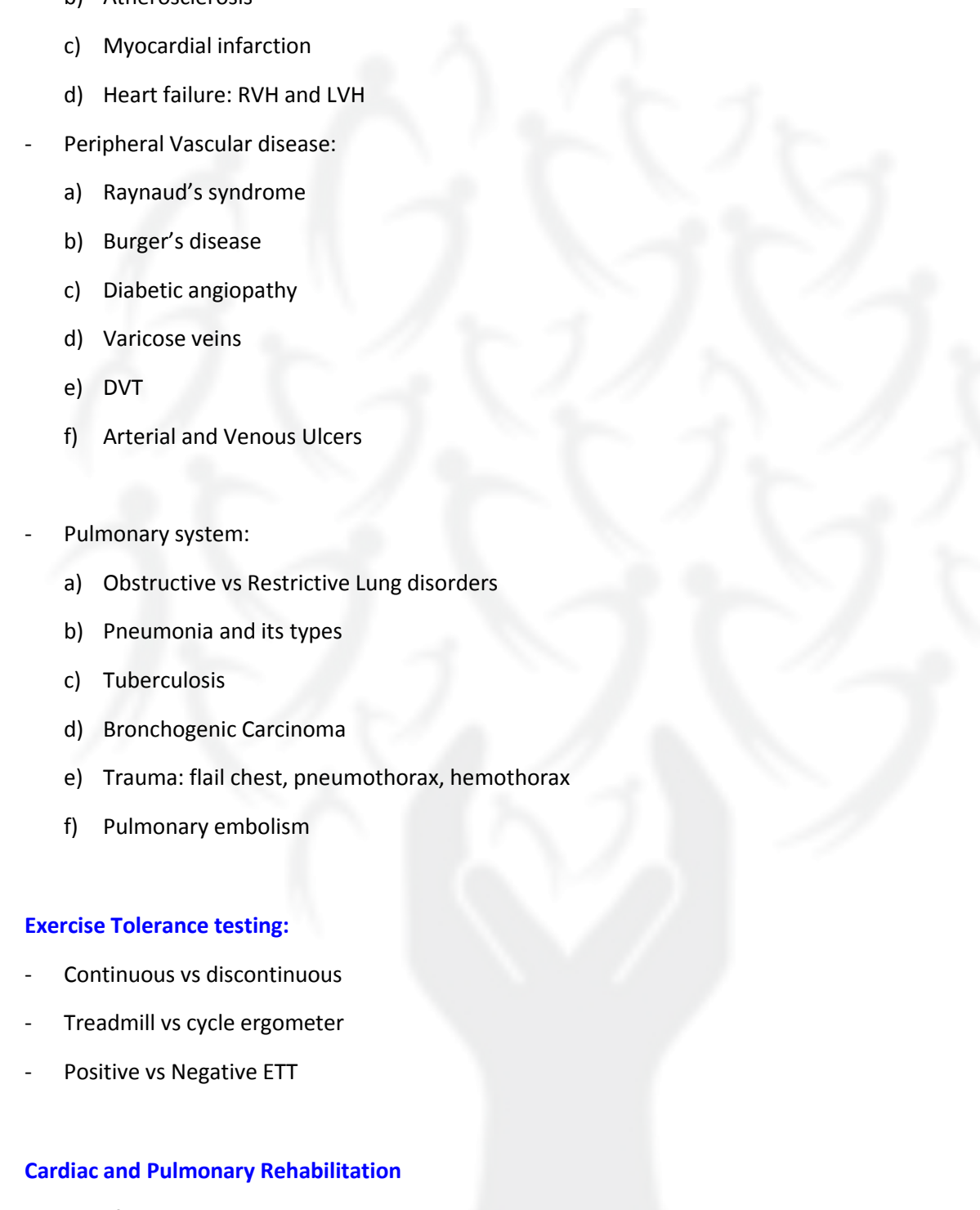
- Spinal nerves; their level of exit

- Spinal level reflexes: Myotatic reflexes, flexor withdrawal and crossed extension

- **Neurological dysfunctions (etiology, pathology, signs and symptoms, examination and differential diagnosis, medical and physical therapy management)**
 - a) Cardio-vascular accident (stroke): Lesion location, arteries involved, characteristics and management
 - b) Traumatic conditions:
 - Spinal Cord injury: various cord syndromes, level wise injury and its features
 - Traumatic Brain Injury: structures involved, their functions and destructive lesions, RLA levels of cognitive functioning and its physical therapy management
 - c) Degenerative conditions:
 - Multiple sclerosis
 - Parkinson's disease
 - Myasthenia Gravis
 - d) Epilepsy and its several types
 - e) Cerebellar disorders:
 - Lesions of archicerebellum, neocerebellum and paleocerebellum
 - Characteristics of cerebellar disorders, examination and management
 - f) Vestibular disorders:
 - Vestibular Neuronitis
 - BPPV
 - UVH, BVH
 - Meniere's disease
 - Dix hallpike test
 - g) Cranial and Peripheral Nerve Disorders:
 - Radiculopathy
 - Bell's Palsy
 - Trigeminal Neuralgia
 - Bulbar vs Pseudobulbar palsy
 - GBS
 - Amyotrophic Lateral sclerosis

CARDIO-VASCULAR, PULMONARY AND LYMPHATIC SYSTEM

- **Anatomy and Physiology**
 - Basic anatomy and physiology of heart, lung and lymphatic system
 - Coronary and lymphatic circulation
 - Cardiac cycle
 - Conduction system of heart
 - Hemodynamics: Stroke volume, Ejection Fraction, Left ventricular end-diastolic volume, Myocardial O₂ demand and consumption (MVO₂ and VO₂ max), cardiac output, rate pressure product (RPP) – their importance and correlation
 - Control mechanisms: Baroreceptor and Chemoreceptors
 - Difference between SNS and PNS
 - Normal mechanics of ventilation
 - Lung volumes and capacities
- **Cardiovascular and Pulmonary examination:**
 - History taking
 - Heart sounds: Normal and abnormal heart sounds, Murmurs, Bruit
 - Vitals and its abnormalities
 - ECG Interpretation: various pathologies and exercise prescription
 - Peripheral venous and arterial circulation- features and differential diagnosis
 - Lab values and their interpretations
 - Normal and Abnormal breath sounds
 - Egophony, Bronchophony and Whispered Pectoriloquy
 - ABG analysis
 - Flow rates
- **Pathological conditions (etiology, pathophysiology, signs & symptoms, examination & possible differential diagnosis, rehabilitation)**
 - Cardiovascular system:

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- a) Angina Pectoris- its various types
 - b) Atherosclerosis
 - c) Myocardial infarction
 - d) Heart failure: RVH and LVH
 - Peripheral Vascular disease:
 - a) Raynaud's syndrome
 - b) Burger's disease
 - c) Diabetic angiopathy
 - d) Varicose veins
 - e) DVT
 - f) Arterial and Venous Ulcers
 - Pulmonary system:
 - a) Obstructive vs Restrictive Lung disorders
 - b) Pneumonia and its types
 - c) Tuberculosis
 - d) Bronchogenic Carcinoma
 - e) Trauma: flail chest, pneumothorax, hemothorax
 - f) Pulmonary embolism
 - **Exercise Tolerance testing:**
 - Continuous vs discontinuous
 - Treadmill vs cycle ergometer
 - Positive vs Negative ETT
 - **Cardiac and Pulmonary Rehabilitation**
 - MET for inpatient, outpatient and home physical therapy
 - Breathing exercises: Diaphragmatic breathing, Paced breathing, Segmental breathing exercise

- Lung clearance techniques: Postural drainage, ACBT, Autogenic drainage
- Rehabilitation for arterial, venous and lymphatic disorders

- **CPR, First aid, Arterial and venous lines**

- **Pharmacology:**

- Cardiac and Pulmonary drugs; classification, mechanism of action, indications, side-effects, drug interaction and brand names.

OTHER SYSTEMS

Integumentary:

- Anatomical and Physiological relations to integumentary systems with tests and measures based on current EBP.
- Differential Diagnosis, prognosis:
It involves differentiating features of different skin conditions and its prognosis with pharmacological and non-pharmacological management with inclination to PT procedures.
- Physical therapy interventions and its concepts with different effects or complications from PT and its medical management.

Metabolic and endocrine disorders:

- Differential Diagnosis of metabolic and endocrine disorders.
With pathological and physiological concepts on plan of care.
- Intervention: Application of PT interventions and its modifications to metabolic and endocrine disorders.

Gastrointestinal disorders:

- Differential Diagnosis of GI with pathological and physiological concepts on plan of care.
- Interventions: Application of PT interventions and its modifications to GI disorders.

Genitourinary disorders:

- Examination of Genitourinary system .
Its related pathological and physiological concepts and its implications on POC.
- Differential Diagnosis of GU, evaluation and its prognosis:
Key DD of GU pathology. And its prognosis on ADL
- Interventions: PT implications of different GU disorders with exercises to Pelvic floor muscles and its modifications.

NON-SYSTEMS

- **Equipment and Devices:**
 - Assistive and adaptive devices- walker, cane and crutches with different types, usage and gait pattern. Wheelchair types like power, sports, obese, amputee and manual along with details about parts, training for propulsion, wheelie, ascending and descending on ramps and curbs.
 - Prosthetic devices with amputation levels for upper limb and lower limb along with details of parts, types, indications. Prosthetic gait deviation with transtibial and transfemoral amputation.
 - Protective, supportive, and corrective orthotic devices for upper & lower limb and spine. Detailed mechanism and indication. Orthotic gait deviations with detailed concepts explanations.

- **Therapeutic Modalities:**
 - Indications, application with dosage, effects, precautions and contraindications of therapeutic modalities mentioned below:
 - Electrical modalities
 - a) Electrical stimulation
 - b) Trans Electrical Nerve Stimulation (TENS)
 - c) High Voltage Pulsed Galvanic Current (HVPC)
 - d) Interferential Therapy/Current (IFT/IFC)
 - e) Iontophoresis
 - f) Russian current
 - Ultrasound modalities including Phonophoresis
 - Mechanical modalities
 - a) Mechanical motion devices (CPM)
 - b) Tilt table
 - c) Traction devices
 - EMG Biofeedback
 - Electromagnetic radiation (e.g., diathermy)
 - Pneumatic compression modalities

- Heat and cold therapy including types of therapy including hot packs, paraffin wax, ice massage and more

- **Professional responsibilities:**

- Types of different settings
- Defensible medical documentation – SOAP notes, error correction, types of notes
- Patient/client rights (e.g., ADA, IDEA, HIPAA) in details
- Human resource legal issues (e.g., OSHA, sexual harassment, incident report)
- Roles and responsibilities of physical therapist, physical therapy assistant, PT students, health-care professionals, and PT aide

- **Research and Evidence based practice**

- Knowledge of basic research concepts like steps of research, steps of evidence based practice, hypothesis, types of research, sampling, types of data (nominal, ordinal, interval, ratio), types of validity, types of reliability, threats to validity, specificity and sensitivity.
- Knowledge of research statistics, standard deviation, types of graphs
- Detailed description of research analysis, strength of correlation coefficient, regression analysis, errors in research (P value)
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